BRANZ Appraised
Appraisal No. 740 [2017]

MULTITUBO PIPING SYSTEM

Appraisal No. 740 (2017).

This Appraisal replaces BRANZ Appraisal No. 740 (2011).

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 The Multitubo Piping System consists of multi-layer composite pipe and fittings for use as the piping components for hot and cold water supply, radiant heating supply and in-floor heating elements. The pipe sizes range from 16 mm to 75 mm.

Scope

2.1 The Multitubo Piping System has been appraised for use as the piping components for water supply as per the scope of New Zealand Building Code (NZBC) Acceptable Solution G12/AS1, and Verification Method G12/VM1 and as pipe for proprietary heating systems subject to specific design.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Multitubo Piping System, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. The Multitubo Piping System meets these requirements. See Paragraphs 8.1 - 8.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Multitubo Piping System meets this requirement and not present a health hazard to people.

Clause G10 PIPED SERVICES: Performance G10.3.1 (a). The Multitubo Piping System contributes to meeting this requirement when used in heating systems. See Paragraph 9.1.

Clause G12 WATER SUPPLIES: Performance G12.3.2 (c) and G12.3.7 (a) and (b). The Multitubo Piping System contributes to meeting these requirements. See Paragraph 12.1.

Technical Specification

Description

4.1 The Multitubo multi-layer composite pipe manufactured by Westfälische Rohrwerke GmbH is formed of longitudinally overlapped welded aluminium with inner and outer layers of polyethylene raised temperature (PE-RT), tightly bonded to the aluminium with adhesive to form a pipe. The multi-layer composite pipe is oxygen tight, which prevents any oxygen diffusion through the pipe wall into closed heating systems.

4.2 The pipe sizes include 16, 20, 25, 32, 40, 50, 63 and 75 mm nominal external diameter, and are continuously marked along their length with the name of the manufacturer, certification information, material type, size, and location, date and time of manufacture. They are also marked with the distance to the end of the pipe in metres.

4.3 The pipes are supplied in coils of 200 and 500 m lengths for 16 mm pipes, 100 m lengths for 20 mm pipes, 50 m lengths for 25 mm pipes and 25 m lengths for 32 mm pipes. All diameter pipes are available in straight tubes of 5 m length.

4.4 There are two ranges of fittings available for use with the Multitubo multi-layer composite pipe. Both incorporate tin-plated dezincification resistant brass but with different means of connecting to the pipes:

- Press fittings. These connectors have a metal sleeve that is crimped onto the pipe through the use of a specially designed crimping tool. They are available for all pipe sizes.
- Push fittings. These connectors have a blue plastic sleeve that allows the pipe to be simply slid into the fitting for the connection to be made. A locking ring within the fitting prevents the pipe from coming out of the joint. No tools are needed to make the connection. These fittings are available for the 16 mm to 32 mm pipes.

4.5 Each fitting is marked with the production code and fitting size.

4.6 The fittings come in a wide range with options available for connection to other systems and hardware.

Tools

4.7 The tools specified by DW Verbundrohr GmbH for installation have not been assessed and are outside the scope of this Appraisal.

Handling and Storage

5.1 Multitubo Piping System components should be handled and stored with care to prevent damage. The pipe and push fittings must be stored where they will not be exposed to sunlight.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Multitubo Piping System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 The Multitubo Piping System for water supply must be designed and installed in accordance with the requirements of NZBC Acceptable Solution G12/AS1. Specific design installations may be designed in accordance with AS/NZS 3500.1 and AS/NZS 3500.4.

7.2 Multitubo pipe is suitable for use in proprietary heating systems. These include embedded heating pipes in concrete slabs and circulation pipes for radiator type heating systems. These systems are to a specific design by the heating system proprietor and components other than the Multitubo pipe and fittings are outside the scope of this Appraisal.

7.3 The Multitubo Piping System must not be used where it will be subject to direct sunlight. Riser sections of pipe in heating systems must be covered from direct sunlight during installation and operation, or until the building is closed in.

7.4 The Multitubo multi-layer composite pipe must not be connected to auxiliary heaters such as solar collection panels or wet-backs without the installation of temperature protection devices in the system. Without protection temperatures may exceed the operating limits. Multitubo pipes and fittings must not be installed within 1 metre of an inlet or outlet of these types of auxilliary heaters.

7.5 Cold water supply pipes must not be embedded in heated concrete slabs. Where water supply pipes must pass through concrete slabs they must do so at right angles to the surface of the slab and be lagged with an impermeable flexible plastic material of not less than 6 mm thickness for the full depth of the slab penetration.

7.6 As the metal sleeves of the press fittings are not stainless steel they must not be used in environments that would be conducive to corrosion.

Durability

8.1 The Multitubo Piping System, when used in easy and moderately difficult areas to access, will meet the NZBC Clause B2 Durability requirements for 5 years and 15 years.

8.2 The Multitubo pipe, when used in areas that are difficult to access, for example in or under concrete slabs, will meet the NZBC Clause B2 Durability requirement of not less than 50 years.

8.3 The above durability statements are based on the Multitubo Piping System not being exposed to working pressures and temperatures above those listed below and being intermittently heated during its life. Long use at higher temperatures will reduce the serviceable life of the system.

Working Pressures and Temperatures

9.1 The maximum working pressure and temperature for the Multitubo Piping System for the 16 mm, 20 mm, 25 mm and 32 mm pipes is 1 MPa at 70°C. The maximum working pressure and temperature for the Multitubo Piping System for the 40 mm, 50 mm, 63 mm and 75 mm pipes is 600 kPa at 70°C. Higher temperatures may be acceptable if lower maximum pressures are used. Consult the Multitubo Technical Literature for more information.

Maintenance

10.1 The Multitubo Piping System hot and cold water supply components and heating system components do not require any special maintenance. Items such as valves and control equipment must be maintained to ensure the maximum working pressures and temperatures are not exceeded.

Control of Internal Fire and Smoke Spread

11.1 In all applications where Multitubo multi-layer composite pipe passes through a fire rated element of a structure or cavity barrier, the opening must be fire-stopped in a way that will permit thermal movement.

11.2 When the pipe is used as a component in an underfloor heating system intended for use with fire-resistance rated suspended floor construction, a Fire Engineer must check that NZBC requirements are met.

Water Supplies

12.1 The Multitubo Piping System has been tested to BS 6920 and is suitable for potable water supply use in accordance with NZBC Acceptable Solution G12/AS1, Clause 2.1.2.

Energy Efficiency

13.1 Domestic type hot water distribution pipes must be insulated in accordance with NZS 4305, Sections 3.7 and 3.8 to meet the requirements of NZBC Clause H1.3.4.

Installation Information

Installation Skill Level Requirements

14.1 Installation of the Multitubo Piping System must be carried out by a Registered Plumber or HVAC Mechanical Installer.

General

14.2 Installation of the Multitubo Piping System for water supply must be in accordance with NZBC Clause G12/AS1, in particular Section 7.

14.3 Systems using Multitubo multi-layer composite pipes and the associated fittings must be designed and installed in accordance with the requirements of this Appraisal and installation information in the Technical Literature.

14.4 When installing multi-layer composite pipe in framed walls, the holes must be accurately sized to allow pipework to expand and contract. In metal framework grommets must be used to protect the pipe from sharp edges.

14.5 Minimum bending radii for the Multitubo pipes are given in Tables 1 and 2 below. Note that only the 16 mm, 20 mm and 25 mm Multitubo pipes may be bent without the aid of bending tools.

Table 1: Minimum Bending Radii for 16, 20 and 25 mm Multitubo Pipes

Pipe Dimension (mm) Diameter and wall thickness	Minimum Bending Radii Without Tools (mm)	Minimum Bending Radii With Internal Bending Spring (mm)
16 x 2.0	80	65
20 x 2.25	100	80
25 x 2.5	125	100

Table 2: Minimum Bending Radii for Other Multitubo Pipe Sizes

Pipe Dimension (mm) Diameter and wall thickness	Minimum Bending Radii With Bending Tools (mm)
32 x 3.0	130
40 x 4.0	160
50 x 4.5	200

Connecting Pipes and Fittings

14.6 Pipes are cut to the correct length using the Multitubo pipe cutting tool. The end of the pipe is made round again and burrs removed by using the de-burring tool. The pipe is slid all of the way into the sleeve of the jointing component so that it can be seen through the slots at the inner end of the sleeve. For the press fittings the sleeve is then crimped using the Multitubo crimping tool.

Heating Component

14.7 It is not recommended to join pipes in locations where they will be concealed within concrete slabs or screeds. If a joint beneath the floor is unavoidable, such as with local damage repair, then Central Heating New Zealand Ltd must be contacted to determine the correct method to do this. This type of connection is outside the scope of this Appraisal.

Charging and Pressure Testing

15.1 Prior to system closure, whether it is for plumbing in wall or floor cavities, or heating systems, a visual check of every fitting is required to ensure all press fitting sleeves are securely crimped.

15.2 All circuits within the system must be flushed with fresh, clean water so that they are free from trapped air and any foreign matter that may have entered the system.

15.3 When all air has been bled from the system, it must be pressure tested.

15.4 Piped services used for potable hot and cold water supply must not show any leakage when subjected to a pressure of 1500 kPa at 20°C for a period of not less than 30 minutes, in accordance with AS/NZS 3500.

15.5 Underfloor heating systems must be tested to the heating system manufacturer's requirements before the concrete is poured. Special precautions may be necessary if the pressure testing of the underfloor heating pipes is to take place in sub-zero temperatures.

Commissioning Underfloor Heating Systems

15.6 Heat must not be applied to underfloor heating systems until the concrete has cured for at least 28 days, however BRANZ Bulletin No. 344 recommends 6 weeks, especially in winter. When cured, water at 20°C must be introduced into the system and maintained for 24 hours, increasing by 5°C every 24 hours thereafter, until the maximum operational flow temperature has been reached. The system must then be allowed to cool until the working temperature is acquired.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

16.1 Tests have been carried out on the Multitubo Piping System by SKZ (Suddeutsches Kunststoff-Zentrum) Testing Laboratory in accordance with DVGW (German Gas and Water Professional Association) worksheet W542 and W534. The test results have been reviewed by BRANZ experts and found to be satisfactory.

16.2 Tests have been carried out on the fittings by SKZ Testing Laboratory in accordance with DVGW worksheet W534.

16.3 Dezincification tests have been carried out on the fittings by Gesellschaft für Elektrometallurgie GmbH in accordance with ISO 6509. The test results have been reviewed by BRANZ experts and found to be satisfactory.

16.4 Multitubo pipe and o-rings in the brass fittings have been tested by Water Regulations Advisory Scheme (WRAS) in accordance with BS 6920. The test results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

17.1 An assessment was made of the durability of the Multitubo Piping System by BRANZ technical experts.

17.2 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

18.1 The Multitubo pipe and fittings are certified to DVGW W534 and are the subject of a DVGW test mark, Registration No. DW-8501BR0253.

18.2 Central Heating New Zealand Ltd is responsible for the quality of the product supplied.

18.3 Quality of installation on site is the responsibility of the installer.

Sources of Information

- AS/NZS 3500.1:2003 Plumbing and drainage - Water services.
- AS/NZS 3500.4:2003 Plumbing and drainage - Heated water services.
- BS 6920: 2014 Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water.
- NZS 4305:1996 Energy efficiency - Domestic type hot water systems.
- DVGW W534: 2015-07 - Pipe connectors and pipe joints in a drinking water installation.
- DVGW W542: 2009 - Compound pipes in drinking water installations; requirements and testing.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

BRANZ

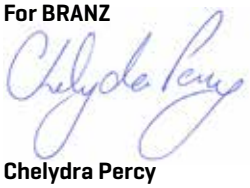
In the opinion of BRANZ, the Multitubo Piping System is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Central Heating New Zealand Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Central Heating New Zealand Ltd:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Central Heating New Zealand Ltd.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Central Heating New Zealand Ltd or any third party.

For BRANZ



Chelydra Percy
Chief Executive

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